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The Impact of Institutional Investors on Firms' Performance in the Context of Financialization

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Abstract

This paper investigates the impact of UK institutional holdings on the financialization process and the performance of listed companies with and without institutional investors. Using panel data analysis, we find that institutional holdings have a positive impact on the financialization process. Further, companies that attract institutional investors outperform their peers matched by industry and size. These findings suggest that institutional investors add value to the capital market and play an instrumental role in shaping the financialization process. Using Granger causality tests, we find that institutional holdings Granger cause financialization.

JEL Classification: C21; G23; L25

Key words: Financialization, Institutional investors, Firms' performance

1. Introduction

Financialization describes a specific process, occurring over a period of time during which capitalism evolves into a system dominated by finance as a key determinant of both economic and social activities, as well as the growth of financial profitability. Epstein (2005) defines financialization as "the increasing role of financial motives, financial markets, financial actors and financial institutions in the operation of the domestic and international economies" (p.3). The institutional setting of financialization has largely been framed in an environment dominated by the global deregulation of both financial and labor markets.

Given the extent to which financialization affects the growth of financial profits over time, it is inevitable that institutional investors influence corporate management and firm performance. For instance, the accumulation of pension and retirement savings over the last 60 years has had a profound impact on the efficient utilization of these assets (Clowes, 2000). Hence, institutional investors could not only influence their portfolio companies, but also the capital market.

Previous studies (see, for example, Black, 1998) have attempted to empirically gauge the impact of institutional investors on the performance of listed companies - including stock price movements, CEO turnover, and institutional monitoring - based on the size of ownership. To the best of our knowledge, however, the influence of institutional holdings on financialization has remained unexplored. It would be interesting to understand the role played, if any, by institutional investors in shaping the financialization process. We use proxies for financialization and investigate the impact of institutional holdings on the financialization process. Since the relationship could be unidirectional or bidirectional, we use Granger causality tests το gain further insights into the causal dimension.

Our results show that institutional holdings have a positive and significant effect on the financialization process. Further tests on causality show that there is a unidirectional causality that runs from institutional holdings to financialization. Stated differently, institutional holdings Granger cause the financialization process and the relationship is one way. In addition, we find that firms that attract only individual institutional investors do not outperform their peers matched by size and industry. However, firms that attract multiple institutional investors outperform their peers significantly, and the evidence is consistent when using institutional investors' portfolio weights instead of holdings. We find that performance differences between companies with and without institutional investors are explained by macroeconomic factors such as (i) the marginal efficiency of capital, (ii) real long-term interest rates, (iii) real effective exchange rates, (iv) GDP per capita, and (v) total factor productivity. Interestingly, the outperformance of companies that attract institutional investors, specifically corporations and insurance firms, remains significant even after controlling for macroeconomic factors. This suggests these investors add more value to the capital markets than other institutional investors and play a significant role in the financialization of the capital markets. Overall, our results show institutional investors play a significant role in shaping financialization and companies that attract institutional investors outperform their peers, based on industry-adjusted and unadjusted performance measures.

This paper contributes to the extant literature on the impact of institutional investors by exploring the role of institutional holdings in the process of financialization and by showing that the

companies that attract these investors outperform their counterparts matched by size and industry between 1997 and 2010[1].

The rest of the paper is organized as follows: Section 2 sets out the key theoretical arguments pertaining to the financialization literature. Section 3 elaborates on the data as well as the methodological aspects of the empirical analysis and Section 4 discusses the results. Finally, Section 5 provides some concluding remarks.

2. Literature Review

The financialization process consists of two interdependent processes. According to Tomaskovic-Devey and Lin (2011), the first process relates to the importance of financial services, whilst the second is linked to the increased involvement of nonfinancial firms in financial activity.

On the empirical front, the number of studies exploring the impact of financial globalization on economic growth has increased significantly, producing conflicting evidence. Kose *et al*. (2009) argue that "there is still little robust evidence of the growth benefits of broad capital account liberalization, but several recent papers in the finance literature report that equity market liberalizations do significantly boost growth" (p.143).

Most importantly, the new role of the financial sector as owners of corporations has dramatically affected the real economy in terms of production, employment, and investment decisions insofar as the objective is the maximization of shareholder value. In the same vein, Aglietta (2000)

[1] The impact of institutional investors on firm performance is well established. See Fich *et al.* (2015), Nagel *et al*. (2015), and Parrino *et al.* (2003).

argues that shareholder value is the new norm in the transformation of capitalism whilst van der Zwan (2014) contends that this norm has "provided the justification for the dissemination of new policies and practices favouring shareholders over other constituents of the firm" (p.102).

Currently, financialization is viewed as one of the key elements of a more general paradigm shift in social and economic relations (see, for instance, Krippner, 2011). Private institutions such as institutional investors – including the market for financial services – have grown significantly over the past four decades, dominating the management of global financial assets (Davis and Steil, 2001). According to the OECD (2011), "institutional investors are financial institutions that accept funds from third parties for investment in their own name but on such parties' behalf" (p.9). They include insurance companies, pension funds, and mutual funds, while other forms such as sovereign wealth funds, hedge funds, and private equity represent a smaller share of the industry. The fact that large investments are made by the fund management industry for the benefits of their clients makes institutional investors a noteworthy force in the capital markets. Insofar as they pursue the optimization of returns for specific levels of risk, as well as for prudential regulation, institutional investors' portfolios comprise diversified investments across numerous companies.

Remuneration for private equity and hedge funds is linked to the performance of portfolio companies. For most institutional investors, however, remuneration is directly tied to the volume of assets under management, whilst fund performance is assessed based on short-term mandates. However, as indicated by Fich *et al*. (2015), the empirical evidence on the role of institutions in improving shareholder wealth is mixed and inconclusive. Furthermore, Clark and Knight (2008) argue that the growth of savings for retirement, in institutions distanced from the immediate

interests of sponsoring companies, significantly changes the balance of power in the financial markets in favour of third-party investors.

The nature and significance of the new structure of the Anglo-American financial markets is detailed in Clark (2000) and Davis and Steil (2001). The accumulation of pension and retirement savings over the last 60 years has had a profound impact on the efficient utilization of these assets, driving a wedge between traded companies and institutional investors, and their market intermediaries (Clowes, 2000). As a result, a new structure of global financial markets has emerged (MacKenzie, 2006).

According to Campbell and Viceira (2002), a majority of pension funds, mutual funds, insurance companies, and endowments are aligned with the principles of modern portfolio theory. This suggests (i) there is a correlation between risk and return on the basis of which particular investments can be assessed in accordance with their expected risk-adjusted rates of return; (ii) the focal point of investment strategy is managing portfolio risk so that the associated risk of a particular investment and the returns should be assessed against the investors' overall objectives; and (iii) markets are so efficient that active investment is not a viable long-term investment strategy. In other words, the modern portfolio theory provides the basis upon which particular stocks are treated as components in a comprehensive strategy of investment management.

On the empirical front, existing evidence suggests that higher institutional ownership is linked to higher R&D and capital expenditure (Baysinger *et al*., 1991; Wahal and McConnell, 2000), as well as increased likelihood and frequency of management earnings forecasts (Ajinkya *et al*., 2005). Moreover, institutional ownership is associated with more extensive social, ethical, and environmental disclosure, as well as reduced earnings for management (Solomon and Solomon, 2006; Hsu and Koh, 2005). Shleifer and Vishny (1986) found that the magnitude of institutional

investment is bound to influence management and ensure they operate in the interests of shareholders, whilst Johnson *et al*. (2010) argue that it reduces the costs of acquiring information.

Undoubtedly, institutional investors have transpired to form a rather complex system of financial institutions and fund management companies operating under their own corporate governance. According to Clark *et al.* (2005), "with the increasing global significance of institutional investors and their portfolio managers, common standards set within well-defined parameters are clearly on the agenda; convergence is the name of the game rather than a tapestry of multi-coloured threads stitched together for the sake of expediency" (p.1).

Within the sphere of global financial flows, significant volumes of currencies are traded on a daily basis, whilst portfolio managers seek to take advantage of arbitrage opportunities. Clark and Wójcik (2003) argue that, in the world of market flows and inter-market arbitrage, information which comes at a premium has significant implications for market efficiency, as well as for the investment performance of portfolio managers.

In drawing parallels with Chandler's (1990) *managerial capitalism*, Clark *et al*. (2005) refer to the object of institutional investment managers as *insider capitalism*. In this context, they argue that "the object of institutional investment managers … is to wring out from those institutions the value held by managers and the untraded benefits that flow through the relationships between insiders as opposed to the property rights of outsiders" (p.2). Currently, institutional investment has provided the basis upon which corporate restructuring is taking place (Clark and Wójcik, 2005).

Notably, one way investment managers have sought to extract value from global financial markets around the world has been by focusing on the empirical relationships that might be found between corporate governance and market value. Inevitably, the conventional metrics implied by finance theory or those proposed by the International Accounting Standards Board constitute a necessary but not a sufficient condition for investment practice.

The displacement, in the Anglo-American world, of managerial capitalism by financial capitalism ushered in an era of the formation of novel national and global institutions with access to a variety of financial resources far greater than those available to self-financing manufacturing corporations. In this context, Jensen (1993) argues that these new financial institutions have been particularly hostile in the battle for corporate control of the market, imposing a new set of rules, regulations, and practices.

To date, stock markets have largely been dominated by institutional investors, turning this novel form of capitalism into a system in which financial institutions are privileged in terms of production and financial investment opportunities. In extracting stock value from incumbent managers, institutional investors have formulated strategies that focus on managers' relationships with other groups inside and outside of the corporation. In this sense, corporations have become exclusive clubs for highly paid but underperforming corporate elites. As such, an investment strategy for corporate domination has become synonymous with market speculation that extends beyond geographical boundaries and institutional systems.

Brownlee (2005) argues that the emerging corporate elite is different from a capitalist class, whilst Scott (2008, p.37) defines the economic elite as an "inter-organizational group of people who hold positions of dominance in business organizations and who may, under certain circumstances, have certain additional powers available to them".

Financial elites or, according to Pareto's (2008) term, 'speculators', were propelled to prominence due, in the main, to the successful implementation of a short-term profitability model that put paid to the managerial elites associated with the post-war Keynesian social framework. The new era that followed the demise of Keynesianism was characterized by deregulation of financial and labour markets that led to the rise of a new form of 'mutated capitalism' in which employers could no longer keep their side of the bargain (Thompson, 2003).

Finance-oriented managers are now in charge of powerful corporations with a remit to increase stock prices (Dobbin and Zorn, 2005). The notion of the shareholder value of a firm has given way to practices that link managerial performance to stock-option perks reflecting short-termism rather than long-term market share, sales, or production-based profit (see Krier, 2005). In the non-finance sectors, corporate leaders have switched from investment strategies that target long-term and productive gains to the short-term goal of increased profitability (Davis, 2009; Stockhammer, 2004; Useem, 1993). As a result, investment in new productive capital is fading away, whereas financial investment is flourishing.

In view of the above exposition, it is evident that the impact of institutional investors on corporate management, board behaviour, and hence investment strategies has significant implications for the performance of the firm which, in turn, acts as a catalyst for the state of the entire economic environment *per se*. However, the question of whether institutional investors (i.e. their holdings) influence the financialization process remains unexplored. This paper aims to fill that gap in the literature.

3. Empirical Investigation

3.1 Data

Our sample consists of 4,000 investments made by UK institutional investors in 651 firms listed on the London Stock Exchange (LSE) between 1997 and 2010.[2] The list of portfolio companies and holdings of these institutional investors, including their classifications, is collected from Thomson One Banker. For each portfolio company, we collect data from DataStream's accounting information to calculate the performance measure (return on assets, ROA) and industry classifications. We track the performance of these unique portfolio companies for up to 10 years and a minimum of 5 years (for the 2010 sample, we track the performance to the end of 2015).[3] Next, we match these portfolio companies to unbacked portfolio companies listed in a market, by industry and size, over the same sample period. We find 1,074 matched unbacked portfolio companies that satisfy our industry and size matching criteria and track their performances for up to 10 years as well. The accounting data and information on industry classification for these unbacked companies are also obtained from DataStream. Given that macroeconomic factors are beyond the control of an organization, we incorporate a string of variables assumed to predict the heterogeneous effects of macroeconomic activity on future corporate performance (Broadstock *et al*., 2011). For this purpose, we collect a set of macroeconomic variables and proxies for financialization from the macroeconomics database provided by the European Commission and the IMF from 1997 to 2015.

The focus of this paper is on the UK market because of the unique feature of its institutional investors relative to those in the US market. Typically, UK institutional investors have more

[2] We include in our study companies for which total institutional holdings are more than 5%.
[3] Our sample ends in 2010, enabling us to track the performance of firms in our sample for at least five years. Our data show that all backed companies had institutional investors to the end of the sample period.

controlling power in their portfolio companies than US institutional investors. For instance, shareholders in the UK can initiate a change to the company memorandum and the articles of association. In most cases, such changes can be made by a 'special resolution', which requires a supermajority approval of 75% of the votes cast at the shareholders' meeting. However, in the US only the board can initiate any change to the corporate charter and the state of incorporation. Shareholders only have the power of veto. Another difference is that investors who hold more than 5% of the voting rights, or at least 100 shareholders, can compel the company to put a resolution to the meeting and to circulate a statement of less than 1000 words before the meeting based on the UK Companies Act (1985). However, in the US shareholders can only request that the board adds a proposal, and the board is not bound by the proposal even if it receives a voting majority. Therefore, the UK market provides a good setting, compared to other markets, for investigating the role played by institutional investors in financialization.

3.2 Methodology

We use the standard OLS panel model to establish the impact of institutional investors on financialization as well as to examine the performance of firms backed and unbacked by institutional investors.[4] We estimate the following two models:

$$FIN_{it} = \alpha_0 + \beta_I \, Institution_{it} + \beta_C \, Control_{it} + Industry + Year + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \alpha_0 + \beta_I \, Institution_{it} + \beta_C \, Control_{it} + \beta_M \, Macrofactor_{it} + Industry + Year + \varepsilon_{it} \quad (2)$$

[4] Since ROA can take both positive and negative values, panel OLS regression is an appropriate estimation technique for our setting.

where *FIN* is the Financial Development Index (for robustness two additional indices have also been used, the Financial Institution Index and the Financial Market Depth Index). In this context, "financial development is defined as a measure of a combination of depth (size and liquidity of markets), access (ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets)" (see Svirydzenka, 2016, p.6)[5]. The Financial Institutions Depth Index is a proxy that enhances the standard banking sector depth measure used in the literature (bank credit to the private sector). Financial institutions efficiency takes into account three aspects of bank efficiency: (i) efficiency in intermediating savings to investment, (ii) operational efficiency measures, and (iii) profitability measures. The financial market index reflects stock market and debt market development. *ROA* is the return on assets. *Institution* is a dummy variable which takes a value of 1 if the firm is backed by corporations, pension funds, insurance companies, or bank and trusts, and 0 otherwise. *Control* includes firm characteristics such as leverage, total assets, and liquidity[6].

Macroeconomic factors include the marginal efficiency of capital (MEC) which is intended to capture expected profitability; the real long-term interest rate (RIR) and real effective exchange rate (REER), reflecting monetary and financial conditions; GDP per capita, a measure of the country's relative performance, total factor productivity (TFP), a measure of efficiency, house

[5] For more on studies using the respective measures of financialization, see (Sung-Jun, 2016 and Mullings, 2018).

[6] Note that in this paper we are concerned with the analysis of financialization through financial institutions' ownership of common stock. We are grateful to a referee for noting that it is possible for institutional investors' ownership of common stock to increase even while the financial sector's overall importance in financing assets shrinks, or while the financial institutions' contribution to GDP shrinks (see DeAngelo *et al.*, 2008; Grinstein and Michaely, 2005).

prices – intended to capture the impact of financialization on housing finance, and finally, household debt.

There is ample evidence to suggest that the macroeconomic environment has a strong impact on firms' financial position (see, for instance, Brown and Ball, 1967; McNamara and Duncan, 1995; Boyd *et al*., 2005; Stock and Watson, 2008; Broadstock *et al*., 2011; Barakat *et al*., 2016). Our selection of macroeconomic factors is in line with the existing literature. More specifically, Issah and Antwi (2017) suggest that the relative performance of a country and its monetary or financial condition are closely associated with firms' performance based on profitability (see Burja and Burja, 2009). According to Fiordelisi and Molyneux (2010), TFP is a significant factor influencing shareholder value creation and hence business performance. Furthermore, Fernandez and Aalbers (2016) argue that the rise of housing finance might be an integral part of macro-economic policy which drives housing finance. Finally, financialization, through raising consumption patterns, has caused higher household debt structures with distributional implications to be formed (Palley, 1994).

We control for industry and year in all our estimations. We test that the variables are not highly correlated to ensure there is no bias from multicollinearity. We use robust standard errors clustered at the firm level. The impact of each macro variable is examined separately, as there are high correlations between these variables. Below, we explain the motivation for our choice of control variables and the expected signs of their coefficients.

3.3 Other control variables

We use *Size* as measured by the logarithm of firms' assets. Collins *et al.* (1987) show that firm size reflects the quality of the firm's information environment. High-quality firms might be

reluctant to invest in a project that is value-destroying. Hence, they are likely to invest in safe projects leading to lower returns. Based on this, we would expect a negative relationship between firm size and performance. Conversely, it is possible that shareholders of high-quality firms will expect high returns and hence managers of such firms are likely to take on riskier projects with high expected returns to satisfy the shareholders' expectations. In this case, we would expect a positive relationship between firm size and performance. Firms with high *Leverage* may struggle to raise funding to finance their growth potential. Hence, they are likely to forgo good investments with higher expected returns due to capital constraints. Therefore, we expect a negative relationship between *Leverage* and performance. Firms with higher *Liquidity (*as measured by the ratio of current assets to current liabilities) have better bargaining power when discussing their credit terms with short-term suppliers. Typically, suppliers are eager to extend credit terms for firms with higher liquidity ratios. Hence, firms are likely to invest their cash in short-term projects to boost their performance. We expect a positive relationship between *Liquidity* and performance. We also use *Institutional holdings* and expect a positive relationship between them and performance. This is because institutional investors are actively engaged in their portfolio firms, in terms of investment and providing the capital required to finance growth opportunities. Therefore, firms with institutional investors are expected to outperform those without them. Next, we discuss the univariate results, followed by the multivariate results.

4. Discussion of Results

4.1 Univariate analysis

Our main focus of attention in this paper is the holdings (i.e. ownership) of institutional investors, since higher holdings indicate a greater impact of institutional investors on financial

markets. In Table 1, columns 1- 4 show the average holding for the population between 1997 and 2010. Corporations maintained their holdings from 1997 to 2007, but their holdings then decreased by approximately 12.7% between 2007 and 2010. Pension funds' holdings in their portfolio companies had been in the range of 40% to 53%, but post-2002 these holdings fell to less than 20% and then remained at this level to the end of 2010. Similarly, insurance companies decreased their holdings from over 30% to less than 20% post-2000. Interestingly, banks and trusts have maintained their 7-13% range of holdings between 1998 and 2010. The fact that institutional investors have adjusted their holdings downward, suggests a decline in the size of their investments, despite an increase in the number of their investments.

Columns 5-8 of Table 1 show the holding of our random sample of 4,000 investments in 651 portfolio companies. It is clear from the table that our random sample provides a good representation of the population in terms of institutional holdings between 1997 and 2010. Our analysis, therefore, is unlikely to be biased towards specific institutional investors. Furthermore, as Table 1 suggests, holdings of corporations are higher than those of other investors, while holdings of banks and trusts are lower on average. This is consistent for the population and random sample.

The values in brackets of Table 1 show the distribution of investments made by UK institutional investors between 1997 and 2010. Columns 1 through 4 show for the populations, while columns 5 to 8 show for the random sample. During the sample period, insurance companies have made the lowest amount of investments. Clearly, banks and trusts, pension funds, and corporations are the key players and contribute significantly to the size and scope of the UK stock market. It is evident from the table that, in the period prior to the Global Financial Crisis (GFC) of 2007/08, these institutional investors had been making fewer investments, but after the crisis, the number

of investments increased almost fourfold, even during the onset of the GFC. Interestingly, the number of investments before and after the GFC remain qualitatively unchanged. There is no evidence to suggest a decline in the number of investments during and after the financial crisis. This signifies the role played by institutional investors in the capital market. Indeed, investments made by these investors have been steadily since 2006.

Overall, the table shows that the difference in means between the population and the random sample is not significant at any conventional level. This suggests that our results based on the random sample can be generalized to the entire population of institutional investors.

[INSERT TABLE 1 HERE]

Table 2 shows the descriptive statistics of the characteristics of the portfolio companies. Panel A shows the results for the full sample while Panel B shows the results for the subsamples that are backed and respectively not backed by institutional investors. The mean leverage for the full sample is 10.5% with a median of 4.5%. The maximum for the companies in our sample is 35.5%, while the minimum is zero. This is consistent with the fact that UK companies are less leveraged than their US counterparts. ROA, which measures the performance, is positive on average, with a mean of 10.9% and a median of 3.2%. The maximum ROA is 66% and the minimum -69.2%. The average size of the firms in our sample, as measured by total assets, is £5.6 billion while the median is £4.8 billion. The largest company in our sample has total assets of £40.42 billion, while the smallest has total assets of £454 million. The liquidity, as measured by the ratio of current assets to current liabilities, is 1.87 on average, with a median of 1.37. This suggests that firms in our sample have the ability, on average, to meet their short-term financial

obligations. In Panel B, we examine the differences in means between firms backed by institutional investors and those not backed. There are no differences in either leverage or liquidity between the two subsamples. However, the backed companies perform better on average and are larger in size than the unbacked ones. The differences in performance and size between the backed and unbacked companies are significant at the 5% level. Overall, the results show that the characteristics of the backed and unbacked companies are similar in terms of leverage and liquidity, but the backed companies perform significantly better than the unbacked ones. Next, we examine whether the differences in performance can be explained by firm characteristics or macroeconomic factors.

[INSERT TABLE 2 HERE]

4.2 Exploring the causal effects

Insofar as institutional investors play a significant role in the capital market, we expect their holdings to influence financialization activities. A significant impact of institutional holdings on the financialization index would suggest that institutional investors influenced financialization in the capital market. However, it is critical to assess the causality in the relationships between the two. Hence, we investigate how changes in the institutional holdings influence changes in financialization. We additionally use the Granger causality test and find that institutional holdings Granger cause financialization, whereas financialization does not Granger cause institutional holdings (see Appendix B for these results). This suggests that the relationship between institutional holdings and financialization is unidirectional. We use three proxies for

financialization: (i) the Financial Development Index, (ii) the Financial Institution Index, and (iii) the Financial Market Depth Index[7].

The results for these proxies are reported in Models 1-3 of Table 3. Based on these results, changes in the institutional holdings appear to have a positive and highly significant impact on changes in financialization. Therefore, institutional investors significantly influence the process of financialization in the market. Thus, we proceed to the next step in which we further investigate the channels through which institutional holdings influence the financialization process. To do so, we compare the performance of listed firms backed by institutional investors to that of firms not backed by institutional investors.

[INSERT TABLE 3 HERE]

4.3 Multivariate analysis

It is evident from Table 3 that institutional holdings have a positive impact on financialization. However, there are different channels through which institutional investors could influence financialization, including the performance of their portfolio companies. If their portfolio companies are outperforming in the market, this performance will be contributing to the capital market and financialization alike. We examine the contribution of institutional investors to the financialization process by investigating the performance of the companies they back. Table 4 shows the determinants of the performance as measured by ROA for firms backed by institutional investors versus unbacked companies. Model 1 shows the performance differences between companies backed by corporations and unbacked companies; Model 2 shows the differences for pension-fund-backed companies; Model 3 shows the results for insurance-firm-

[7] For further details on the construction of the indices used, see Svirydzenka (2016)

backed companies; Model 4 shows the results for banks and trusts. It is evident in Models 1, 2, and 4 that the size of the firm and leverage have negative impacts on performance, while liquidity, measured by the ratio of current assets to current liabilities, has a positive impact on performance. The variables of interests in Models 1, 2, and 4 are the dummy variables for corporations, pension funds, and banks and trusts. It is clear from these models that firms backed by these types of institutional investors *do not* outperform unbacked companies. However, firms backed by insurance companies do outperform unbacked ones and the difference is statistically significant at the 10% level.

[INSERT TABLE 4 HERE]

We next extend our analysis by examining the impact of a string of macroeconomic factors on the performance of backed and unbacked companies. As mentioned previously, we use five macroeconomic variables deemed to significantly affect firms' performance: (i) the marginal efficiency of capital (MEC), (ii) the real long-term interest rate (RIR), (iii) the real effective exchange rate (REER), (iv) GDP per capita, and (v) total factor productivity (TFP). Due to the high correlations between them, we examine their impact on performance individually. The results are shown in Table 5. Models 1-5 show respectively the impact of the MEC, RIR, REER, GDP per capita, and TFP. Models 1 and 3 suggest that increases in the MEC and the REER have a positive impact on performance, while increases in the RIR have a negative impact. GDP per capita and TFP are found to exert no impact on performance. The finding that companies backed by corporations and insurance companies outperform unbacked companies is robust when controlling for macroeconomic factors. Together, the results show that macroeconomic factors explain away the better performance of companies backed by pension funds or banks and trusts.

However, these factors do not explain away the better performance of companies backed by corporations or insurance companies.

[INSERT TABLE 5 HERE]

4.4 Multivariate analysis – Further perspectives

In Table 5 we show the contemporaneous effect of the relationship between institutional holdings and performance. Provided institutional holdings influence the performance of the portfolio companies, it is more sensible to examine whether changes in holdings influence changes in performance. In other words, we are looking at whether an increase in the previous institutional holdings improves future firm performance. Panel A of Table 6 shows the results for the full sample. It can be seen that changes in the institutional holdings enhance the performance of the companies, controlling for macroeconomic variables. It is evident from the table that firms that attract backing from corporations and insurance companies tend, on average, to do better. We conclude from the table that increases in institutional holdings enhance performance. However, it is possible that institutional investors tend to invest more in firms that already have better performance. Therefore, the evidence of an increase in the institutional holdings enhancing the performance is inconclusive. To distinguish between selection and value added by institutional investors to their backed companies, we split the sample into high- and low-ROA portfolio companies. Panel B of Table 6 shows the results for the subsample of firms whose ROA is below the median value. Model 1-6 are similar to Panel A, but based on a subsample of firms where ROA is below median values. It is evident from Models 1-6 that institutional holdings have a positive impact on ROA. This indicates that institutional investors add value to

their portfolio companies regardless of their holdings. Overall, the results show that the presence of institutional investors enhances firm performance as measured by ROA.

[INSERT TABLE 6 HERE]

To avoid the possible bias associated with the raw ROA, we also use the industry adjusted ROA. For each firm in our sample in each year, we subtract the median industry returns, using the Fama and French 12-industry classification. Panel A of Table 7 shows the impact of institutional holdings on these industry-adjusted ROAs. Models 1-5 show that an increase in the holdings improves the performance adjusted by the industry, consistent with the results reported in Table 6. Following Fich *et al.* (2015), we also use portfolio weights, as an additional measure of institutional holdings. They argue that institutional investors have an incentive to monitor their portfolio companies when their holdings represent a large part of the institution's total portfolio. We calculate the portfolio weight for an individual institutional investor as their investment in a company relative to their total investment in all their portfolios. Panel B of Table 7 shows the results using portfolio weights of the institutional investors instead of their holdings. It is evident in Models 1-5 that the higher is the portfolio weight, the higher is the firm performance, in line with the findings of Fich *et al*. (2015).

[INSERT TABLE 7 HERE]

4.5 Robustness tests

So far, we have used ROA or industry-adjusted ROA as the performance measure. To assess the robustness of our results, we use excess market returns as an alternative measure of performance.

For each firm in each year, we calculate the stock returns and subtract the equivalent market benchmark returns. We expect a positive relationship between institutional holdings and excess market returns, provided institutional investors enhance the performance of the firms they back. In Models 1-5 of Table 8, we can see that institutional holdings do have a positive impact on excess market returns. The evidence is statistically and economically significant. This suggests that institutional investors enhance the performance of the companies they back, based on market and accounting-based measures of performance.

[INSERT TABLE 8 HERE]

4.6 Propensity score matching

Our sample of unbacked companies are matched by size and industry. Due to the difficulties in finding an appropriate match for each company backed by institutional investors, we allow variations in size up to a maximum of 20%. However, as this is likely to induce bias in our findings regarding institutional holdings adding value to firm performance, we also use propensity score matching. Thus, we match each backed company with an equivalent unbacked company based on a propensity score estimated using size, leverage, liquidity, industry, and year. Using caliper radius matching, we classify each unbacked company as a match for a backed company if the propensity scores of the two companies differ by no more than 1% (following Dehejia and Wahba, 2002). Using the sample of matched observations, we estimate our regression again (similarly to the models reported in Table 6 Panel A). Consistent with those prior results, we find that the institutional holding coefficients are lower than in our earlier analyses (Table 6 Panel A); however, they are still statistically and economically significant.

Overall, the results in Table 9 suggest that institutional investors add value to their portfolio companies by enhancing their performance.

[INSERT TABLE 9 HERE]

5. Conclusions

This study examines the impact of institutional holdings on the financialization process, and the performance of firms that attract institutional investors relative to their peers matched by industry and size, between 1997 and 2010. The empirical evidence shows that institutional investors influence the financialization process and the relationship is unidirectional according to a Granger causality test. Further, we show firms that attract institutional investors outperform their peers, using industry-adjusted and unadjusted performance measures. However, our results show that macroeconomic factors explain away the performance differences between firms with and without institutional investors. The better performance of firms that attract institutional investors, specifically corporations and insurance firms, remained significant even after controlling for macroeconomic factors. This suggests that these types of investors add more value to the companies they back than other institutional investors do.

Overall, our results suggest that institutional investors play a significant role in shaping the financialization process through their contributions to capital markets. The implication of our results for the wider economy is of great significance in that institutional investors ultimately influence the economy through their capital market investment decisions. The financialization of industrial and commercial capital that has been unfolding over the last four decades has been of paramount importance as the activities of the financial sector have shifted away from its

traditional intermediating role. In other words, the increasing orientation of institutional investors towards financial activities is depriving the economy of productive physical investment that is likely to adversely affect long-term economic growth.

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Table 1: Institutional holdings

	Investments by investor type (population)				Investments by investor type (sample)				Difference in means (t-test)			
	Corporations	Pension funds	Insurance companies	Banks and trusts	Corporations	Pension funds	Insurance companies	Banks and trusts				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)-(5)	(2)-(6)	(3)-(7)	(4)-(8)
Year												
1997	0.480 (19)	0.512 (28)	0.674 (5)	0.448 (22)	0.615	0.408	0.591	0.548	-1.529	1.256	1.009	-1.469
1998	0.476 (30)	0.503 (37)	0.398 (10)	0.085 (18)	0.334	0.574	0.110	0.290	1.045	-0.604	1.229	-0.850
1999	0.444 (40)	0.467 (46)	0.349 (15)	0.092 (25)	0.489	0.396	0.153	0.034	-1.419	1.395	0.700	1.176
2000	0.401 (36)	0.400 (42)	0.080 (14)	0.080 (23)	0.650	0.409	0.065	0.044	0.782	-1.232	1.034	0.870
2001	0.682 (35)	0.528 (32)	0.170 (1)	0.108 (5)	0.804	0.597	0.170	0.005	-1.477	-1.370	1.308	1.005
2002	0.613 (108)	0.184 (77)	0.122 (18)	0.068 (75)	0.627	0.195	0.050	0.040	-1.311	-1.398	0.561	0.847
2003	0.465 (146)	0.178 (96)	0.172 (33)	0.056 (92)	0.569	0.082	0.288	0.056	-1.322	1.021	-1.437	-1.132
2004	0.416 (148)	0.117 (155)	0.201 (57)	0.076 (148)	0.433	0.126	0.164	0.150	-0.787	-0.858	0.672	-0.824
2005	0.530 (186)	0.093 (219)	0.159 (73)	0.135 (215)	0.652	0.075	0.125	0.143	-1.405	0.644	0.896	0.788
2006	0.595 (221)	0.101 (243)	0.149 (68)	0.129 (242)	0.594	0.123	0.052	0.123	0.516	-1.381	0.943	0.572
2007	0.444 (265)	0.107 (267)	0.114 (88)	0.091 (314)	0.559	0.133	0.120	0.084	-0.918	-1.224	-0.838	0.956
2008	0.352 (257)	0.124 (282)	0.126 (93)	0.095 (307)	0.404	0.218	0.145	0.152	-1.269	-1.263	-0.596	-0.853
2009	0.389 (245)	0.123 (258)	0.159 (72)	0.104 (285)	0.451	0.112	0.215	0.163	-0.717	0.720	-0.884	-1.054
2010	0.394 (278)	0.122 (272)	0.115 (65)	0.090 (338)	0.391	0.101	0.109	0.078	1.027	0.530	0.827	1.227
Average	***0.477 (2014)***	***0.254 (2054)***	***0.213 (612)***	***0.118 (2019)***	***0.541***	***0.253***	***0.168***	***0.136***	***-1.140***	***0.783***	***1.292***	***-0.667***

This table shows the percentage of shares (expressed in decimal) owned by UK corporations, pension funds, insurance companies, and banks and trusts between 1997 and 2010. The values in brackets are the actual numbers of investments made (i.e. numbers of companies backed) by these institutional investors. Column 1-5 shows the holding and the number of investments for the full population, while column 5-8 shows the holding and the number for the random sample used in our analysis. We also test the difference in the percentage of institutional holdings between the population and the random sample

Table 2: Descriptive statistics

Panel A: Full sample	*Mean*	*Median*	*StDev*	*Min*	*Max*
Leverage	0.105	0.045	0.125	0.000	0.355
ROA	0.109	0.032	0.123	-0.692	0.667
Size (million)	5608	4830	122	454	40420
Liquidity	1.872	1.378	1.408	0.570	5.671
MEC	0.114	0.150	0.135	-0.300	0.200
RIR	2.764	2.400	1.195	1.400	5.100
REER	113.81	116.00	10.24	94.10	126.50
GDP per capita	37277	38079	2771	32194	40890
TFP	97.864	98.900	4.691	89.500	104.500
No of obs	***14972***				

Panel B: Subsample	*Backed firms*		*Unbacked firms*			
	Mean	*Median*	*Mean*	*Median*	T-test	Z-value
Leverage	0.107	0.046	0.102	0.044	1.112	0.847
ROA	0.179	0.049	0.034**	0.014	-2.130**	-2.512**
Size (million)	6430	8152	4787**	1507	-2.871**	-2.741**
Liquidity	1.887	1.391	1.862	1.366	0.115	0.167
No of obs	***5880***		***9092***			

Notes: This table shows the descriptive statistics (mean, median, standard deviation, minimum and maximum) for the variables based on the random sample and matched sample of firms that are not backed by the institutional investors. Panel A shows the results for the full sample, while Panel B shows the results for the subsamples of firms that are backed and are not backed by institutional investors. The t-tests for the means are based on unequal samples and unequal variances. Differences in medians are tested using the Wilcoxon test. The data are winsorized at 1%. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 3: Multivariate analysis using three different proxies for financialization

Dependent Variable	Expected Signs	Model 1: ΔFinancial Development Index		Model 2: ΔFinancial Institution Index		Model 3: ΔFinancial Market Depth Index	
		Coeff	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
ΔCorporations	(+)	0.049***	(0.000)	0.046***	(0.000)	0.048***	(0.000)
ΔPension funds	(+)	0.070***	(0.000)	0.065***	(0.000)	0.058***	(0.000)
ΔInsurance firms	(+)	0.057***	(0.000)	0.053***	(0.000)	0.055***	(0.000)
ΔBanks and trusts	(+)	0.067**	(0.026)	0.072**	(0.022)	0.064**	(0.031)
Ln (household debt)	(+)	0.032	(0.131)	0.041	(0.141)	0.032	(0.166)
Ln (real house price)	(+)	0.072**	(0.011)	0.061**	(0.042)	0.059**	(0.023)
Ln (financial liberation)	(+/-)	-0.027	(0.168)	-0.031	(0.188)	-0.048	(0.114)
Ln (financial sector leverage)	(+)	0.173***	(0.000)	0.122***	(0.000)	0.126***	(0.000)
Constant		0.217***	(0.000)	0.265***	(0.000)	0.303***	(0.000)
Year and industry		Y		Y		Y	
No of obs		***72***		***72***		***72***	
Adjusted R^2		0.112		0.114		0.111	

Notes: Δ denotes changes of the respective variables; The table shows the impact of institutional holding on financialization controlling for other common determinants. Model 1 shows the impact of institutional holdings on the Financial Development Index, Model 2 shows that on the Financial Institution Index and Model 3 shows that on the Financial Market Depth index. We control for the year and industry dummies. We use robust standard errors clustered at the firm level ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 4: Multivariate analysis (dependent variable return on assets (ROA))

		Model 1		Model 2		Model 3		Model 4	
Variables	*Expected Signs*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
Corporations	(+)	0.055	(0.157)						
Pension funds	(+)			0.010	(0.668)				
Insurance firms	(+)					0.042*	(0.087)		
Banks and trusts	(+)							0.011	(0.629)
Ln size	(+/-)	-0.038***	(0.000)	-0.039***	(0.000)	-0.039***	(0.000)	-0.039***	(0.000)
Liquidity	(+/-)	0.077***	(0.000)	0.077***	(0.000)	0.077***	(0.000)	0.077***	(0.000)
Ln leverage	(-)	-0.271***	(0.000)	-0.270***	(0.000)	-0.270***	(0.000)	-0.270***	(0.000)
Constant		0.257***	(0.000)	0.257***	(0.000)	0.257***	(0.000)	0.258***	(0.000)
Year and industry		Y		Y		Y		Y	
No of obs		***10484***		***12239***		***9675***		***10539***	
Adjusted R^2		0.156		0.155		0.162		0.171	

Notes: Model 1 shows the impact of corporation holdings on performance, Model 2 that of pension fund holdings, Model 3 that of insurance firm holdings, Model 4 that of bank and trust holdings, and Model 5 that of all institutional holdings. The variables are as defined in the Appendix. We control for the year and industry dummies. We use robust standard errors clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 5: Multivariate analysis - controlling for macroeconomic factors (dependent variable return on assets (ROA))

		Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	*Expected Signs*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.161**	(0.010)								
RIR	(+/-)			-0.018*	(0.095)						
REER	(+)					0.002***	(0.009)				
GDP per capita	(+)							0.001	(0.148)		
TFP	(+)									0.003	(0.214)
Corporations	(+)	0.096**	(0.044)	0.100**	(0.036)	0.095**	(0.047)	0.100**	(0.037)	0.101**	(0.035)
Pension funds	(+)	0.051	(0.144)	0.056	(0.107)	0.050	(0.152)	0.055	(0.114)	0.055	(0.110)
Insurance firms	(+)	0.078**	(0.035)	0.081**	(0.027)	0.076**	(0.039)	0.080**	0.030)	0.080**	(0.029)
Banks and trusts	(+)	0.055	(0.114)	0.060*	(0.081)	0.055	(0.114)	0.059*	(0.088)	0.060*	(0.085)
Ln size	(+/-)	0.012*	(0.098)	0.012*	(0.093)	0.012*	(0.082)	0.012*	(0.083)	0.012*	(0.082)
Liquidity	(+/-)	0.081***	(0.000)	0.081***	(0.000)	0.082***	(0.000)	0.081***	(0.000)	0.081***	(0.000)
Ln leverage	(-)	-0.349***	(0.000)	-0.349***	(0.000)	-0.350***	(0.000)	-0.349***	(0.000)	-0.350***	(0.000)
Constant		0.273***	(0.000)	0.275***	(0.000)	0.296***	(0.000)	0.246***	(0.000)	0.239***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***14972***		***14972***		***14972***		***14972***		***14972***	
Adjusted R^2		0.196		0.192		0.197		0.191		0.191	

Notes: Model 1 shows the impact of the marginal efficiency of capital (MEC), Model 2 that of the real long-term interest rate (RIR), Model 3 that of the real effective exchange rate (REER), Model 4 that of GDP per capita, and Model 5 that of total factor productivity (TFP). The variables are as defined in the Appendix. We control for the year and industry dummies. We use robust standard errors clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 6: Multivariate analysis - controlling for macroeconomic factors (dependent variable is ΔROA)

		Model 1		Model 2		Model 3		Model 4		Model 5	
Panel A: Full sample	*Expected Signs*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.162**	(0.010)								
RIR	(+/-)			-0.019*	(0.093)						
REER	(+)					0.003***	(0.007)				
GDP per capita	(+)							0.001	(0.141)		
TFP	(+)									0.002	(0.216)
ΔCorporations	(+)	0.088**	(0.041)	0.096**	(0.041)	0.090**	(0.034)	0.095**	(0.041)	0.094**	(0.029)
ΔPension funds	(+)	0.047	(0.151)	0.049	(0.110)	0.043	(0.141)	0.048	(0.134)	0.041	(0.121)
ΔInsurance firms	(+)	0.071**	(0.038)	0.078**	(0.033)	0.073**	(0.031)	0.077**	0.030)	0.075**	(0.032)
ΔBanks and trusts	(+)	0.061	(0.121)	0.056*	(0.091)	0.049	(0.123)	0.046*	(0.076)	0.052*	(0.076)
Ln size	(+/-)	0.013*	(0.078)	0.011*	(0.075)	0.014*	(0.071)	0.011*	(0.091)	0.013*	(0.093)
Liquidity	(+/-)	0.076***	(0.000)	0.086***	(0.000)	0.079***	(0.000)	0.084***	(0.000)	0.079***	(0.000)
Ln leverage	(-)	-0.337***	(0.000)	-0.327***	(0.000)	-0.344***	(0.000)	-0.317***	(0.000)	-0.341***	(0.000)
Constant		0.211***	(0.000)	0.275***	(0.000)	0.296***	(0.000)	0.246***	(0.000)	0.241***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***14972***		***14972***		***14972***		***14972***		***14972***	
Adjusted R^2		0.195		0.191		0.196		0.190		0.192	

Table 6 continues on next page

Table 6 continued

Panel B: Subsample	Expected Signs	Model 1		Model 2		Model 3		Model 4		Model 5	
		Coeff	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.105**	(0.010)								
RIR	(+/-)			-0.013*	(0.093)						
REER	(+)					0.002***	(0.007)				
GDP per capita	(+)							0.001	(0.141)		
TFP	(+)									0.002	(0.226)
ΔCorporations	(+)	0.063**	(0.022)	0.076**	(0.032)	0.065**	(0.027)	0.094**	(0.038)	0.075**	(0.034)
ΔPension funds	(+)	0.037	(0.163)	0.037	(0.131)	0.040	(0.162)	0.038	(0.140)	0.031	(0.151)
ΔInsurance firms	(+)	0.050**	(0.029)	0.052**	(0.041)	0.073**	(0.041)	0.052**	0.042)	0.054**	(0.041)
ΔBanks and trusts	(+)	0.037	(0.161)	0.037*	(0.088)	0.036	(0.132)	0.045*	(0.089)	0.034*	(0.088)
Ln size	(+/-)	0.011*	(0.081)	0.007*	(0.068)	0.01*1	(0.083)	0.008*	(0.094)	0.011*	(0.081)
Liquidity	(+/-)	0.056**	(0.011)	0.079**	(0.041)	0.062**	(0.022)	0.068**	(0.012)	0.076**	(0.020)
Ln leverage	(-)	-0.297***	(0.000)	-0.268***	(0.000)	-0.220***	(0.000)	-0.209***	(0.000)	-0.280***	(0.000)
Constant		0.201***	(0.000)	0.209***	(0.000)	0.195***	(0.000)	0.192***	(0.000)	0.161***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***7620***		***7620***		***7620***		***7620***		***7620***	
Adjusted R^2		0.195		0.191		0.196		0.190		0.192	

Notes: Δ denotes changes of the respective variables; Model 1 shows the impact of the marginal efficiency of capital (MEC), Model 2 that of the real long-term interest rate (RIR), Model 3 that of the real effective exchange rate (REER), Model 4 that of GDP per capita, and Model 5 that of total factor productivity (TFP). Panel A shows the results for the full sample, while Panel B show the results for the subsample of firms with ROA below the median value. The variables are as defined in the appendix. We control for the year and industry dummies. We use robust standard errors clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 7: Multivariate analysis - controlling for macroeconomic factors (dependent variable industry-adjusted return on assets (ROA_adj)

		Model 1		Model 2		Model 3		Model 4		Model 5	
Panel A: Institutional holdings	*Expected Signs*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.112**	(0.032)								
RIR	(+/-)			-0.014	(0.103)						
REER	(+)					0.002**	(0.017)				
GDP per capita	(+)							0.001	(0.133)		
TFP	(+)									0.002	(0.201)
ΔCorporations	(+)	0.078**	(0.043)	0.087**	(0.032)	0.081**	(0.044)	0.083**	(0.032)	0.085**	(0.033)
ΔPension funds	(+)	0.043	(0.164)	0.052	(0.121)	0.039	(0.162)	0.041	(0.141)	0.037	(0.141)
ΔInsurance firms	(+)	0.072**	(0.029)	0.069**	(0.037)	0.070**	(0.041)	0.071**	0.033)	0.074**	(0.041)
ΔBanks and trusts	(+)	0.057	(0.141)	0.051*	(0.108)	0.047	(0.131)	0.047*	(0.086)	0.050*	(0.068)
Ln size	(+/-)	0.011*	(0.088)	0.012*	(0.071)	0.013*	(0.082)	0.014*	(0.089)	0.015*	(0.073)
Liquidity	(+/-)	0.067***	(0.000)	0.075***	(0.000)	0.071***	(0.000)	0.076***	(0.000)	0.073***	(0.000)
Ln leverage	(-)	-0.337***	(0.000)	-0.301***	(0.000)	-0.312***	(0.000)	-0.305***	(0.000)	-0.315***	(0.000)
Constant		0.191***	(0.000)	0.201***	(0.000)	0.217***	(0.000)	0.209***	(0.000)	0.221***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***14972***		***14972***		***14972***		***14972***		***14972***	
Adjusted R^2		0.191		0.192		0.192		0.187		0.188	

Table 7 continues on next page

Panel B: Portfolio weights	*Expected Signs*	Model 1		Model 2		Model 3		Model 4		Model 5	
		Coeff	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.163**	(0.022)								
RIR	(+/-)			-0.021*	(0.088)						
REER	(+)					0.005***	(0.005)				
GDP per capita	(+)							0.002	(0.112)		
TFP	(+)									0.002	(0.203)
ΔCorporations	(+)	0.093**	(0.032)	0.101**	(0.032)	0.096**	(0.041)	0.103**	(0.022)	0.097**	(0.031)
ΔPension funds	(+)	0.053	(0.121)	0.055	(0.102)	0.046	(0.132)	0.051	(0.116)	0.043	(0.133)
ΔInsurance firms	(+)	0.082**	(0.022)	0.084**	(0.031)	0.080**	(0.037)	0.079**	0.035)	0.084**	(0.021)
ΔBanks and trusts	(+)	0.069	(0.110)	0.061*	(0.087)	0.052	(0.131)	0.054*	(0.088)	0.059*	(0.065)
Ln size	(+/-)	0.014*	(0.088)	0.013*	(0.071)	0.016*	(0.073)	0.018*	(0.079)	0.017*	(0.087)
Liquidity	(+/-)	0.072***	(0.000)	0.085***	(0.000)	0.082***	(0.000)	0.086***	(0.000)	0.083***	(0.000)
Ln leverage	(-)	-0.331***	(0.000)	-0.333***	(0.000)	-0.341***	(0.000)	-0.318***	(0.000)	-0.346***	(0.000)
Constant		0.212***	(0.000)	0.269***	(0.000)	0.278***	(0.000)	0.238***	(0.000)	0.241***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***14972***		***14972***		***14972***		***14972***		***14972***	
Adjusted R^2		0.188		0.191		0.193		0.189		0.191	

Notes: Δ denotes changes of the respective variables; Model 1 shows the impact of the marginal efficiency of capital (MEC), Model 2 that of the real long-term interest rate (RIR), Model 3 that of the real effective exchange rate (REER), Model 4 that of GDP per capita, and Model 5 that of total factor productivity (TFP). In Panel B, we report the results using the portfolio weights instead of institutional holdings. The variables are as defined in the Appendix. We control for the year and industry dummies. We use robust standard errors clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 8: Multivariate analysis - controlling for macroeconomic factors (dependent variable adjusted change in market returns (ΔMkt_ret_adj))

		Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	*Expected Signs*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.156**	(0.021)								
RIR	(+/-)			-0.023*	(0.075)						
REER	(+)					0.011**	(0.012)				
GDP per capita	(+)							0.002	(0.122)		
TFP	(+)									0.004	(0.313)
ΔCorporations	(+)	0.082**	(0.044)	0.093**	(0.029)	0.089**	(0.037)	0.094**	(0.032)	0.091**	(0.041)
ΔPension funds	(+)	0.043	(0.137)	0.041	(0.121)	0.039	(0.127)	0.044	(0.123)	0.038	(0.145)
ΔInsurance firms	(+)	0.076**	(0.031)	0.077**	(0.028)	0.073**	(0.041)	0.071**	(0.032)	0.072**	(0.032)
ΔBanks and trusts	(+)	0.054	(0.121)	0.057*	(0.091)	0.048	(0.122)	0.047*	(0.076)	0.057*	(0.055)
Ln size	(+/-)	0.011*	(0.079)	0.010*	(0.069)	0.013*	(0.077)	0.016*	(0.081)	0.015*	(0.077)
Liquidity	(+/-)	0.068***	(0.000)	0.088***	(0.000)	0.079***	(0.000)	0.083***	(0.000)	0.077***	(0.000)
Ln leverage	(-)	-0.271***	(0.000)	-0.283***	(0.000)	-0.291***	(0.000)	-0.268***	(0.000)	-0.286***	(0.000)
Constant		0.134***	(0.000)	0.127***	(0.000)	0.131***	(0.000)	0.130***	(0.000)	0.133***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***14972***		***14972***		***14972***		***14972***		***14972***	
Adjusted R^2		0.191		0.192		0.189		0.193		0.195	

Notes: Δ denotes changes of the respective variables; Model 1 shows the impact of the marginal efficiency of capital (MEC), Model 2 that of the real long-term interest rate (RIR), Model 3 that of the real effective exchange rate (REER), Model 4 that of GDP per capita, and Model 5 that of total factor productivity (TFP). The variables are as defined in the Appendix. We control for the year and industry dummies. We use robust standard errors clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 9: Multivariate analysis (propensity score matching) - controlling for macroeconomic factors (dependent variable is change in return on assets (ΔROA))

		Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	*Expected Signs*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*	*Coeff*	*P-value*
MEC	(+)	0.091**	(0.021)								
RIR	(+/-)			-0.010*	(0.075)						
REER	(+)			D		0.002**	(0.012)				
GDP per capita	(+)							0.001	(0.122)		
TFP	(+)									0.003	(0.313)
ΔCorporations	(+)	0.057**	(0.041)	0.060**	(0.033)	0.052**	(0.041)	0.067**	(0.042)	0.067**	(0.038)
ΔPension funds	(+)	0.025	(0.157)	0.035	(0.132)	0.023	(0.165)	0.026	(0.132)	0.026	(0.151)
ΔInsurance firms	(+)	0.043**	(0.029)	0.055**	(0.034)	0.047**	(0.036)	0.051**	(0.043)	0.050**	(0.039)
ΔBanks and trusts	(+)	0.034	(0.121)	0.035*	(0.088)	0.029	(0.141)	0.027*	(0.081)	0.029*	(0.068)
Ln size	(+/-)	0.008	(0.155)	0.007	(0.269)	0.010	(0.261)	0.008	(0.171)	0.009	(0.181)
Liquidity	(+/-)	0.047	(0.1320)	0.061	(0.114)	0.055	(0.131)	0.045	(0.165)	0.046	(0.166)
Ln leverage	(-)	-0.182	(0.1210)	-0.222	(0.131)	-0.241	(0.124)	-0.209	(0.161)	-0.225	(0.134)
Constant		0.143***	(0.000)	0.181***	(0.000)	0.192***	(0.000)	0.130***	(0.000)	0.159***	(0.000)
Year and industry		Y		Y		Y		Y		Y	
No of obs		***3209***		***3209***		***3209***		***3209***		***3209***	
Adjusted R^2		0.166		0.157		0.161		0.162		0.163	

Notes: Δ denotes changes of the respective variables; Model 1 shows the impact of the marginal efficiency of capital (MEC), Model 2 that of the real long-term interest rate (RIR), Model 3 that of the real effective exchange rate (REER), Model 4 that of GDP per capita, and Model 5 that of total factor productivity (TFP). The variables are as defined in the Appendix. We control for the year and industry dummies. We use robust standard errors clustered at the firm level. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Appendix A: Definition of variables

Variable	Definition
Corporations	The ownership of corporations firms in a portfolio company
Pension funds	The ownership of pension funds in a portfolio company
Insurance firms	The ownership of insurance firms in a portfolio company
Banks and trusts	The ownership of banks and trusts in a portfolio company
Ln size	Logarithm of firms' total assets
Liquidity	Ratio of current assets to current liabilities
Ln leverage	Ratio of total liabilities to total assets
Marginal efficiency of capital (MEC)	Marginal efficiency of capital, total economy (AKGDV) - AMECO Database
Real long-term interest rate (RIR)	Central government bonds 20 years - AMECO Database
Real effective exchange rate (REER)	Real effective exchange rates (XUNRQ) - AMECO Database
GDP per capita	Constant GDP per capita (Federal Reserve)
Total factor productivity (TFP)	Total factor productivity (ZVGDF) - AMECO Database
Financial Development Index	Financial Development Index (FDFDIX) - IMF
Financial Institution Index	Financial Institution Index (FDTIDIX) - IMF
Financial Market Depth Index	Financial Market Depth Index (FDFMDIX) - IMF
Household debt	Household debt total, % of net disposable income (HHDEBT) - OECD
Real house price	House prices adjusted for retail prices – ONS, UK.
Financial liberation	Financial Liberation Index - CESifo DICE
Financial sector leverage	Financial sector leverage (debt to equity), % - EUROSTAT

Appendix B: Granger causality tests

Causality test		Prob > F
Panel A: Financial Development Index		
Financial Development Index	Corporations	0.000
Financial Development Index	Pension funds	0.000
Financial Development Index	Insurance firms	0.013
Financial Development Index	Banks and trusts	0.022
Institutional Holdings		
Corporations	Financial Development Index	0.586
Pension funds	Financial Development Index	0.539
Insurance firms	Financial Development Index	0.771
Banks and trusts	Financial Development Index	0.190
Panel B: Financial Institution Index		
Financial Institution Index	Corporations	0.940
Financial Institution Index	Pension funds	0.161
Financial Institution Index	Insurance firms	0.900
Financial Institution Index	Banks and trusts	0.194
Institutional Holdings		
Corporations	Financial Institution Index	0.030
Pension funds	Financial Institution Index	0.010
Insurance firms	Financial Institution Index	0.000
Banks and trusts	Financial Institution Index	0.000
Panel C: Financial Market Index		
Financial Market Depth Index	Corporations	0.002
Financial Market Depth Index	Pension funds	0.463
Financial Market Depth Index	Insurance firms	0.980
Financial Market Depth Index	Banks and trusts	0.676
Institutional Holdings		
Corporations	Financial Market Depth Index	0.020
Pension funds	Financial Market Depth Index	0.000
Insurance firms	Financial Market Depth Index	0.013
Banks and trusts	Financial Market Depth Index	0.000

This table shows the results of Granger causality tests. Panel A shows the results for the Financial Development Index, Panel B for the Financial Institution Index, and Panel C for the Financial Market Depth Index. Panel A shows that the lags of institutional holdings are significant at all conventional levels, while the lag of the Financial Development Index is not significant at any conventional level. This suggests that institutional holdings Granger cause financialization, while Financialization does not Granger cause the institutional holdings. The evidence is statistically significant and consistent for all measures of financialization (Panels B and C respectively). Overall, the results of the Granger causality test between financialization and institutional holdings show a unidirectional relationship.